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(54) Sterngear Arrangement

(57) A sterntube 1 mounted in the hull of the vessel 2 is connected to propeller bracket 4 by a rigid watertight tube 3.

The propeller shaft 5 is carried in bearings in the sterntube and propeller bracket and is fitted with watertight rotary seals or glands 6 where it enters the sterntube and leaves the propeller bracket.

Water passage ways are provided in the sterntube and propeller bracket to allow water circulation from inside the vessel through the sterntube and bearing 1, the tube 3, and propeller bracket and bearing 4.

This closed water circuit can be utilised for engine cooling, protection of sterntube bearings for vessels operating in polluted or sandy waters and for the protection of propeller shafts against corrosive attack.

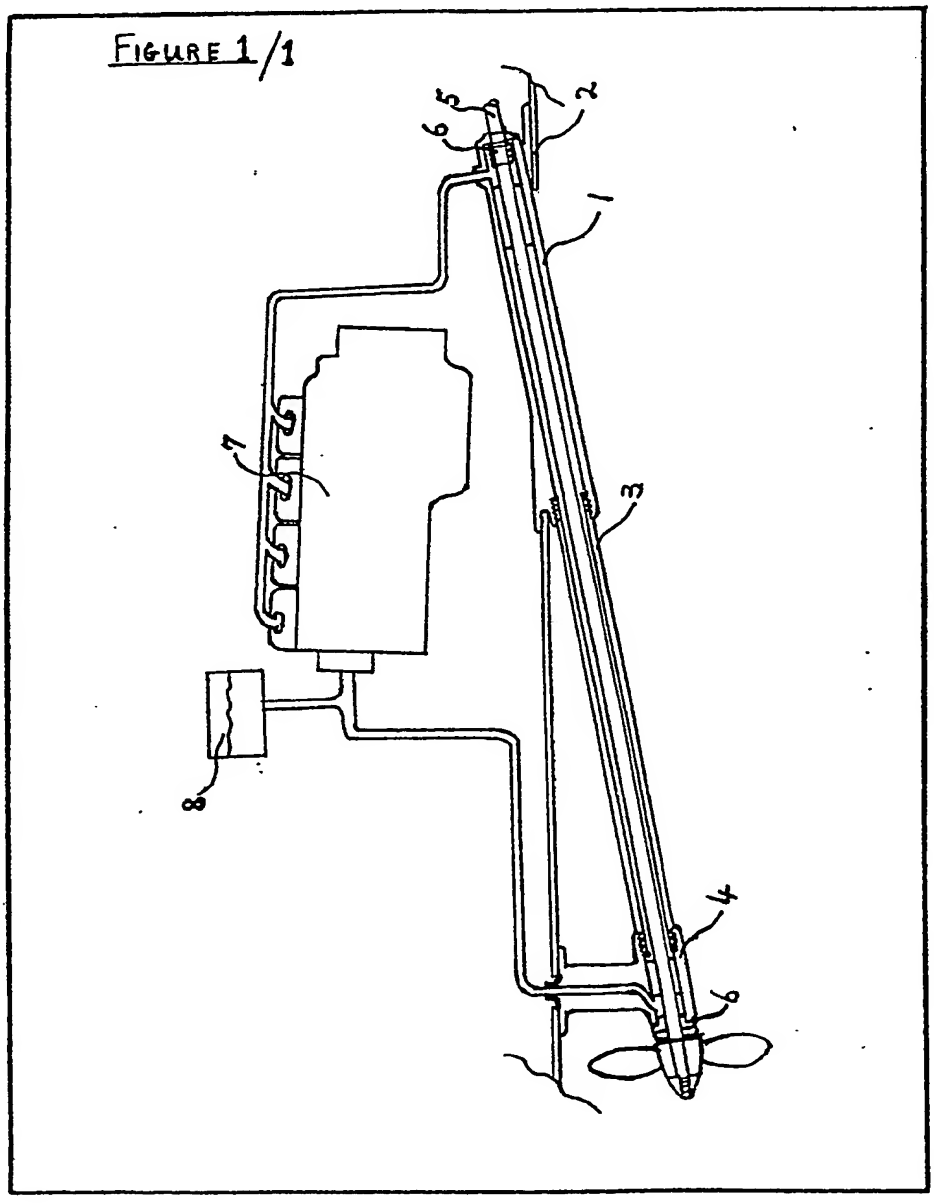

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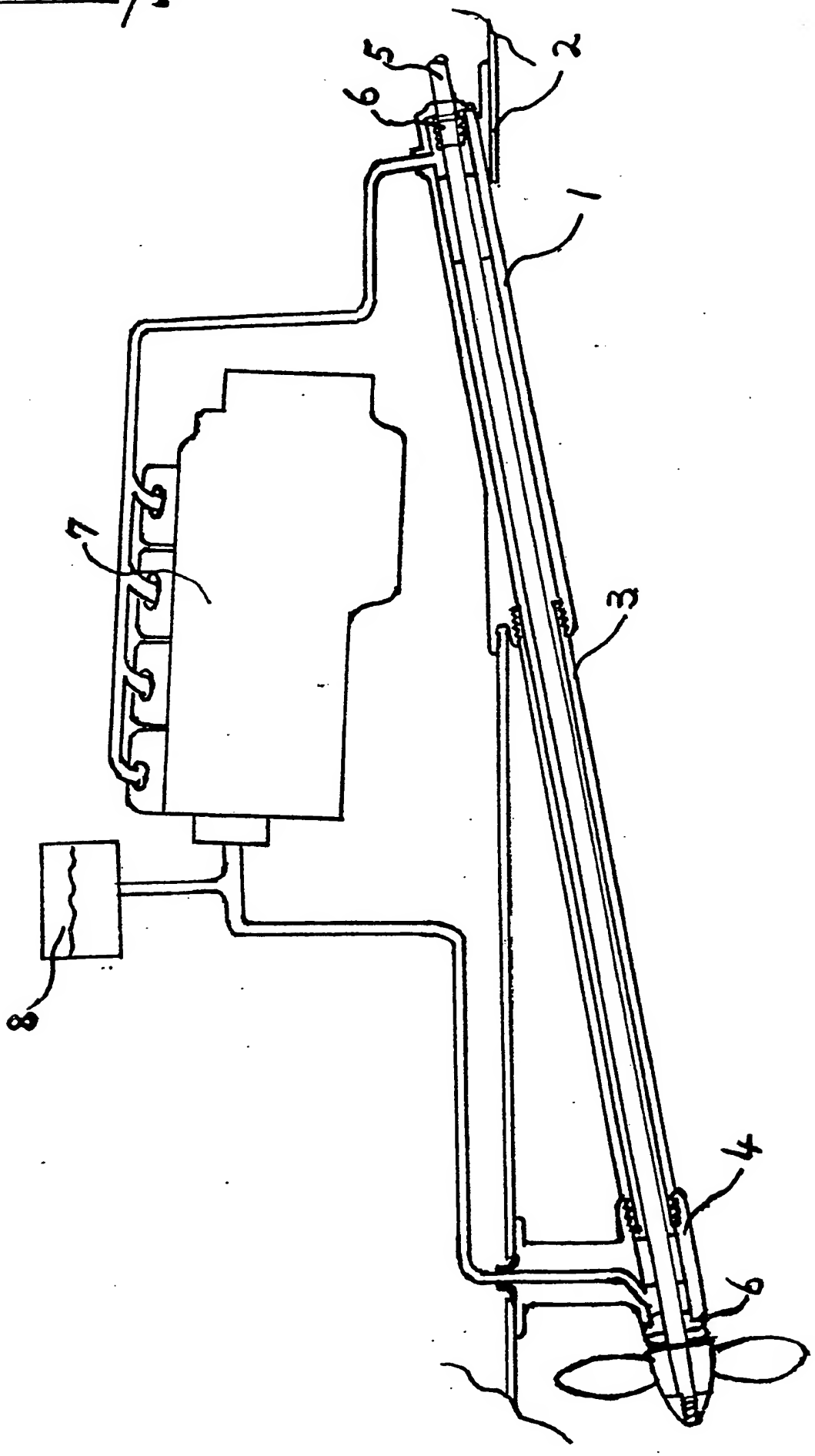
FIGURE 1/1



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SPECIFICATION

Sterngear Arrangement for a Water-Borne Vessel

According to the present invention there is provided a sterngear arrangement for a water-borne vessel where a length of propeller shaft is carried external to the hull and is enclosed for its full length in a tube which in turn is connected at its forward end to a sterntube casting and at its after end to the propeller bracket casting; such connections being of a rigid and watertight means.

At the forward end of the sterntube casting, where the propeller shaft enters, there is arranged a watertight sealing means of mechanical or stuffing box type and a further sealing means at the after end where the shaft leaves the propeller bracket. The propeller bracket carries a water lubricated bearing and a further bearing can be fitted at the sterntube if required.

In both the sterntube casting and propeller bracket casting passage ways are formed to allow for the flow of water into or out of the castings, the water passing through the bearings and through the annular space between the propeller shaft and its surrounding tube. The water returns from the castings back to the inside of the hull through suitable watertight attachment of the sterntube and propeller brackets.

Pipes inside the hull connect the passage ways in the castings to the cooling circuit of the vessel's engine so that the complete unit forms a closed fresh water cooling circuit. The hot water leaves the engine, passes round the circuit and is cooled by transfer of heat to the sea water which surrounds the sterngear as described when the vessel is in the water.

The present invention will now be described by way of example:—

With reference to the accompanying drawing Figure 1 shows a side view in section of the after end of a water-borne vessel with a simple engine cooling installation. In this arrangement a sterntube 1 is mounted by watertight means in the vessel's hull 2 and is connected by a rigid water-tight joint to a tube 3 which in turn at its after end makes a watertight connection to the propeller bracket 4, this in turn being connected to the hull by rigid watertight means.

The propeller shaft 5 enters the sterntube from the vessel through a watertight sealing arrangement 6 and runs through the tube to the propeller bracket where a further watertight seal 6 is located. Hot water from the engine 7 is led to the inlet passage ways of the sterntube where it passes down the full length of the tube of the tube to the propeller bracket, being cooled by the surrounding sea water; the heat transfer being assisted by the rotary motion of the propeller shaft. In the propeller bracket the water flows through the propeller shaft bearing and then returns via suitable connections into the vessel and back to the engine water pump suction, thence to recirculate round the system.

An expansion tank 8 is connected to the engine water pump suction to maintain a head of fresh water in the closed circuit.

For a more powerful engine, the simple tube 3 could be replaced by an aerofoil section tube incorporating additional water passage ways to give extra cooling surface area. The water would enter and leave the aerofoil section tube through suitable connections and passage ways in the sterntube 1 and propeller bracket 4. To suit the more powerful engine the expansion tank 8 would become a mixing tank with connections to the engine and suitable baffles so that the water flow round the engine could be at a faster rate.

A separate pump would circulate water from the hot section of the mixing tank through the sterntube, aerofoil section tube and propeller bracket, returning it to the cooler part of the mixing tank; the flow rate being determined by the cooling requirement.

It could be arranged that water circulation be assisted by impeller type means fitted to the propeller shaft at the forward end of the sterntube 1 and giving a circulating effect to the water when the propeller shaft is rotating. Such a system could be utilised where fresh water circulation of the sterntube and propeller bracket bearings is required but no engine cooling is involved.

Claims

1. A sterngear arrangement for a water-borne vessel in which the propeller shaft external to the hull is enclosed in a watertight tube and by means of suitable passage ways and seals fresh water can be circulated through the tube while being isolated from the surrounding sea water.

2. An arrangement according to claim 1 wherein the engine cooling system of a water-borne vessel is such that hot water from the engine passes through the sterngear arrangement accordingto claim 1, is cooled and returns to the engine. By this arrangement the need for sea water pumps and heat exchangers is avoided.

3. An arrangement in accordance with claim 1 or 2 to give clean water lubrication to the propeller shaft bearings of water-borne vessels which have to operate in poluted or sandy waters.

4. An arrangement in accordance with claim 1, 2 or 3 to protect the propeller shaft from sea water corrosive attack and to enable the shaft to be made of normal steel rather than special corrosion resistant materials.

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